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Report of Audit

REPORT OF AUDIT OF
THE ADMINISTRATION OF HAWAII'S WATER PROGRAM
UNDER SECTIONS 7 AND 8 OF THE
FEDERAL WATER POLLUTION CONTROL ACT
REPORT NO. E1W3-09-020-372

FEB 22 1973

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U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Audit
Washington, D.C. 20460

ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

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FEB 22 1973

TO: Mr. Paul De Falco, Jr.
Regional Administrator, Region IX
San Francisco, California

FROM: Director
Office of Audit

SUBJECT: Report of Audit of the Administration of Hawaii's Water Program Under Sections 7 and 8 of the Federal Water Pollution Control Act
Report No. E1W3-09-020-372

Enclosed is the subject audit report prepared by the Office of Audit. This report is considered to be Administratively Confidential and should not be released outside of EPA.

We have given consideration to the comments provided by the region in response to our draft findings in the preparation of this report. However, it should be noted that the regional comments did not specify what actions were being taken on the audit recommendations. In accordance with EPA Order 2750.1, please submit, within 60 days, an Initial Report of Action Taken with respect to each recommendation which was directed to your office. Your response should be submitted to the Director, Office of Audit. To facilitate identification, please refer to the above audit control number in all correspondence relating to this report.

The courtesies and cooperation extended to the auditors by the region are greatly appreciated.

John D. Lisle

JOHN D. LISLE

Enclosure

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PURPOSE AND SCOPE OF AUDIT

We have performed an audit of the State of Hawaii's administration of its water program under Sections 7 and 8 of the Federal Water Pollution Control Act (the Act) for the primary purpose of determining the effectiveness and efficiency of the financial and management controls being followed to accomplish these sections of the Act. The audit covered current operations through August 11, 1972. The audit was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as were considered necessary in the circumstances.

GENERAL INFORMATION

The Hawaii Department of Health (DOH) has overall responsibility for the control of any pollution that is harmful, detrimental or injurious to public water supplies, fish, aquatic life and wildlife or adversely affects recreational, agricultural, industrial or other legitimate uses of water. The Sanitary Engineering Branch of the Environmental Health Division of the DOH has primary responsibility for the state's water pollution control activities. The branch is assigned 7 engineers, 8 environmental health specialists, and one water pollution control inspector. At the time of our audit, only 6 of the 8 environmental health specialists' positions were filled. Four of these specialist positions are permanently assigned to the islands of Kauai, Maui and Hawaii to coordinate all water pollution control activities on their respective islands. At the present time, all islands' activities requiring engineering review are provided to the Sanitary Engineering Branch in Honolulu for consultation and advisement. In addition, the branch is supported by the Laboratories Branch of the DOH for bacteriological and chemical analysis. In January 1968 Hawaii published Chapters 37 and 37A of the Public Health Regulations which form the basis for enforcement of the state's water quality standards. A comprehensive plan was developed by Hawaii and subsequently approved by EPA for fiscal year (FY) 1973 to deal with all Hawaii's environmental areas (air, water, solid waste and noise).

The state's expenditures for water pollution control and the Federal funds provided under Section 7 of the Act are presented below:

Fiscal Year	State Funds	Federal Funds	Total
1972	$332,369	$103,500	$435,869
1971	269,650	71,923	341,573
1970	110,723	65,100	175,823
1969	110,902	66,931	177,833

In FY 1973, Hawaii was awarded a comprehensive Federal grant of $228,600 to cover all of its environmental programs. The grant was divided as follows: $108,600 for water program planning; $150,000 for air pollution control; and $30,000 for solid waste management. Allotments to Hawaii under Section 8 of the Act for construction of wastewater treatment facilities were as follows:

Fiscal Year	Federal Funds
1972	$6,766,350
1971	3,410,900
1970	3,398,600
1969	1,348,100

As of September 30, 1972, only $5,852 of the FY 1972 allotment had been obligated.

SUMMARY OF RESULTS OF AUDIT

During the period since the prior audit, there have been some positive developments in Hawaii's Water Pollution Control Program. These included: the implementation of a permit program, an increase in the number of monitoring stations, an increase in the size of the staff assigned to water pollution control, and the preparation of a comprehensive grant for FY 1973. However, our review disclosed that the efficiency and effectiveness of the state's water program could be further improved by (i) strengthening the administration of the permit program,(ii) obtaining and utilizing water quality monitoring data, (iii) establishing construction grant procedures relating to operation and maintenance inspections and interim inspections and strengthening water quality management planning, and (iv) revising procedures for accounting for funds provided under Section 7 of the Act. Some of the conditions discussed in this report have generally been recognized as problems as far back as FY 1968 and many have been listed as objectives for accomplishments in the state's Water Pollution Control Plans since this date. A number of the same objectives are again included in the FY 1973 comprehensive grant. However, in view of the state's inability to accomplish the stated objectives in the past, we believe that the implementation

of the specific recommendations contained in this report should facilitate accomplishment of the objectives and result in a more effective water pollution control program in Hawaii.

Eligible state matching costs significantly exceeded the amounts required by Hawaii to earn the Federal funds under Section 7 of the Act. Accordingly,we consider the grant amounts claimed during FY 1969 through 1972 to be acceptable as follows:

Fiscal Year	Claimed and Accepted
1972	$103,500 (1)
1971	$ 71,923
1970	$ 65,100
1969	$ 66,931

(1) At the time of our audit, the state was in the process of preparing its ROE for FY 1972 and indicated that grant costs of $103,500 would be claimed for FY 1972.

Our findings are summarized below and detailed in the Audit Findings and Recommendations section of this report. Regional comments are also included in the Audit Findings and Recommendations section.

State Permit Program

The state's waste discharge permit program needed improvement to assure maximum control and abatement of pollution in public waters. We found that (i) formal procedures were not established to identify all dischargers, (ii) a number of previously identified dischargers had not been placed under the permit program, (iii) permits for some dischargers had expired prior to completion of acceptable corrective measures, and (iv) procedures were not established to verify pollution abatement actions reported by dischargers. In addition, controls over self-monitoring reports on dischargers needed to be strengthened to assure that reports were received, were complete, contained representative data and were followed up in instances of adverse or worsening conditions. Also, instances were noted where the state had not established a leadership role since pollution was not effectively abated at state-controlled facilities. Further, we noted that "zones of mixing" were being granted under circumstances that did not appear compatible with basic water quality standards and in a number of instances the zones were of a size that provided some dischargers with a means of achieving compliance with specific standards without effluent treatment (page 6).

Water Quality Monitoring

The water pollution control program in Hawaii could be strengthened by improving procedures for obtaining and utilizing water quality monitoring data. Our review disclosed that (i) monitoring was not performed at one island, (ii) monitoring data were not always obtained from some sampling stations, and (iii) available monitoring data, which in some instances indicated violations of water quality standards, were not being adequately reviewed and summarized. As a result, the DOH has not always documented adverse trends or initiated studies to isolate the causes for the water quality violations. In addition, routine drinking water samples obtained by state water pollution control personnel have often shown adverse readings for extended periods without corrective action being initiated. We also noted that the state's procedures for surveillance of permittees needed improvements to assure that spot checks were made as to the accuracy of reported effluent data. Further, monitoring for other pollutants such as heavy metals and pesticides should be accomplished. Additionally, clarification or revision to certain portions of the state's water quality standards were necessary to assure that the standards were applicable and enforceable under all circumstances (page 18).

State Construction Grant Procedures

Procedures for performing operation and maintenance (O&M) inspections after construction and interim inspections during construction of Federally-financed wastewater treatment plants were not established. As a result, the state has not performed required O&M inspections on projects completed since November 1968, although some were experiencing operational difficulties which have adversely affected the quality of the receiving waters. In addition, interim inspections had not been performed on the two active projects valued at about $2 million nor on three recently completed projects valued at $7.6 million. Also, adequate follow-up action was not taken to assure that Interim Water Quality Management Plans were received within the time frames established in the state's FY 1972 Water Pollution Control Plan. Further, most of the scheduled pollution abatement actions included in the state's original implementation plan and a proposed revision in October 1971 have not been met. Additionally, procedures needed to be developed to assure that project plans and specifications did not contain inadequacies which can lead to restrictive bidding or a conflict of interest (page 26).

Accounting for Section 7 Funds

State procedures for accounting for Section 7 Water Pollution Control funds were not fully effective in the areas of timekeeping and reporting of state matching costs. As a result, labor costs charged to program elements were not properly supported and time distribution records were

not maintained by all employees charged to the program. Additionally, state matching costs were not always accurately reported on the Reports of Expenditures submitted to EPA (page 33).

STATUS OF PRIOR RECOMMENDATIONS

The Department of Health, Education and Welfare (DHEW) Audit Agency performed the prior audit covering grant activities for the period July 1, 1967 to December 31, 1968. The audit report, dated November 21, 1969, contained four recommendations for corrective action. Our follow-up review on the status of these recommendations indicated that satisfactory corrective actions had been taken on only that recommendation pertaining to the elimination of personnel shortages. With respect to the other three recommendations, we found that they were only partially corrected. One of these concerned an increase in the number of pollution monitoring stations to the number planned. Although the number of monitoring stations has increased from 69, at the time of the prior audit, to about 200, it is still short of the 379 stations provided for in the FY 1968 State Plan. Another recommendation concerned evaluating and taking action on all permit applications received. Since the prior audit, the state has made progress in implementing a permit program. However, there are still applications, some dating back to November 1968, which have not been evaluated. This problem and other deficiencies noted during our review of the permit program are contained in Finding and Recommendation No. 1 of this report. The other recommendation requested the state to make a formal request to the FWPCA for assistance in performing a baseline study. Although the state, in a letter dated October 15, 1969, requested such assistance, we were informed that a response to this request was not received. Consequently, the baseline study has not been performed.

AUDIT FINDINGS AND RECOMMENDATIONS

1 - State Permit Program

Improvements in the state's waste discharge permit program were needed to assure maximum control and abatement of pollution of public waters. Our review disclosed that (i) formal procedures were not established to identify all dischargers, (ii) a number of previously identified dischargers had not been placed under the permit program, (iii) permits for some dischargers had expired prior to completion of acceptable corrective measures, and (iv) procedures were not established to verify pollution abatement actions reported by dischargers. Also, controls over self-monitoring reports on discharges needed to be strengthened to assure that reports were received, were complete, contained representative data and were followed up in instances of adverse or worsening conditions. In addition, we noted instances where pollution was not effectively abated at state-controlled facilities and consequently the state was not establishing a leadership role. Further, we noted that "zones of mixing" were being granted under circumstances that did not appear compatible with basic water quality standards and in a number of instances the zones were of a size that provided some dischargers with a means of achieving compliance with specific standards without effluent treatment.

Background

Upon adoption of Chapters 37 and 37A of Hawaii's Public Health Regulations on December 26, 1967, it became illegal to discharge any wastes into the waters of the state if such discharge would reduce those waters below quality standards. In order to provide a means of transition, a permit system was adopted. A permit could not be obtained unless the application and supporting information clearly showed that it was in the public interest and the application contained a schedule of implementing actions necessary to meet water quality standards. Dischargers in leeward Oahu were required to file for permits upon publication of applicable water quality standards in September 1968. Similar notices were published for other geographical areas over the succeeding 12 months in the following sequence: Kauai, Maui, Hawaii and windward Oahu.

Inventory of Dischargers

The state did not have a program to identify all dischargers. The initial inventory of dischargers to be brought under the permit program

was compiled from responses to newspaper publication of the requirement to file for waste discharger permits, plus responses to direct notification of those major dischargers known to exist per the personal knowledge of state personnel. Physical canvassing or mail inquiry dealing from directories of businesses and maps of towns, villages and developments were not accomplished to identify potential dischargers. Since the compilation of the initial inventory of dischargers, the state has generally relied upon public complaints and unanticipated discoveries of the Environmental Health Specialists while in the field as a means of adding dischargers to the permit program. Because of this approach, it is likely that some dischargers that are required to apply for waste discharger permits have not been identified. This is evidenced by the fact that three new dischargers were identified in March and April 1972 by public complaints alone. In order to maximize water pollution abatement effort, it is our opinion that a formal program of canvassing and mail inquiry should be established to assure that all discharges of effluent into public waters are identified and brought under the permit program.

Schedules of Corrective Action

Action was needed by the state to place all dischargers not currently meeting water quality standards under implementation schedules specifying appropriate corrective measures. Dischargers requiring such action include those who have never been brought under the permit program and those whose waste discharger permits have expired prior to corrective action. Further, procedures should be strengthened to assure that implementation schedules require timely corrective action when relatively simple abatement facilities can be used. For situations involving more elaborate facilities or the scheduled abandonment of operations, implementation schedules should require acceptable and timely interim measures.

Dischargers Not Under Permit. We noted nine instances where dischargers had not been granted permits with implementation schedules or waivers although permit applications had been on hand for as long as 45 months. The applications from these dischargers were received during the period November 20, 1968 through November 4, 1971. Six of the nine instances noted involved dischargers of thermal wastewater such as the Honolulu Gas Co., Wailua Sugar Co., and Gaspro, Inc. The permit applications for these dischargers have remained in suspense with no action taken by the state. It appeared that the state was undecided as to whether to grant zones of mixing or insist upon abatement measures. For the most part, these dischargers were relatively low volume in nature, as opposed to many of the larger electrical companies who have been granted zones of mixing. This inaction has resulted in inconsistencies of treatment between the larger and smaller thermal dischargers and in a lack of timely action in establishing implementation schedules to abate these sources of pollution.

In addition to the thermal dischargers, we noted that three other dischargers were not under permit. One of these pertained to the discharge

of irrigation tailwater by Gay and Robinson. Since this discharger had never demonstrated "best practicable" treatment, intent to install abatement facilities or lack of harmful effect of the tailwater on receiving waters, the permit process had been "stalled" since the last public hearing on this matter on May 5, 1971. An implementation schedule was not established to abate this source of pollution. It should be noted that despite its protracted efforts involving implementation schedules, the state has never undertaken formal enforcement action (fines and/or penalties for non-compliance) against these dischargers.

Dischargers with Expired Permits. We noted eight instances where discharger's permits had expired prior to the completion of acceptable corrective measures without renewal of the permits or revision to the implementation schedules. In these instances, the permit application files did not indicate current compliance with water quality standards or qualification for zones of mixing. Dischargers falling into this category included Young Brothers, Ltd., Mauna Kea Sugar Co. (Moirton Subdivision), Ahuimanu Wastewater Treatment Plant and HC&D, Ltd.

In the case of Young Brothers, the discharge involved cattle barge wash down operations resulting in extremely high coliform readings in the Honolulu harbor. A waste discharge permit was issued for the period April 30, 1971 through June 15, 1971. Due to an inadequate implementation schedule,the state DOH staff recommended against continuance of the permit. During contested hearings, the discharger indicated that it was developing preliminary engineering reports covering the problem, including the alternative of hooking up to the city sewer system. However, in September 1971, the state Department of Transportation (DOT) indicated its intention to develop a waterfront sewage plant capable of treating all discharges within the harbor. The report indicated that the Young Brothers' pollution problem was only a small part of the clean up program. In March 1972, DOT indicated that it would ask the FY 1973 legislature for FY 1974 capital improvement funds to develop master plans for waterfront sewer systems statewide. Implementation schedules would be established when the master plans were completed. This has resulted in a delay of abatement action for what would appear to be at least 5 years and relieved the discharger of its pollution abatement responsibility. Consequently, Young Brothers has continued its practice of washing down cattle barges in the Honolulu harbor without benefit of a waste discharge permit or a commitment to implement interim abatement measures.

In the case of the Mauna Kea Sugar Co., the discharge involved raw sewage from its Moirton plantation camp. A waste discharge permit was initially issued for the period September 18, 1970 through August 1974, but was subsequently revised to April 19, 1972 in order to conform to a revised implementation schedule. On March 10, 1972, the discharger requested a delay without suggesting a new date on the basis of its intent to design a higher level treatment facility tying in three different plantation camps. The reason given for not establishing a firm revised date

was that the houses involved were owned by the tenants and therefore the construction of treatment facilities would qualify for Federal grant assistance under Section 8 of the Federal Water Quality Act. Awaiting such assistance will result in an indefinite delay in implementing corrective measures. As a result, Mauna Kea has continued to discharge raw sewage without benefit of a waste discharge permit, a firm implementation schedule, or commitment to adopt interim measures. In our opinion, the time required to secure Federal grant assistance is not an acceptable excuse for delaying corrective measures. In view of the current level of Federal construction grant funding in Hawaii and the relatively low priority this project would have as compared with the number of needy municipalities statewide, a significant delay in correcting these conditions is inevitable. As in the case of those dischargers for whom waste discharger permits have never been issued, the state has not undertaken formal enforcement action against these dischargers.

Private Sugar Plantation Camps. The State FY 1972 Water Pollution Control Plan identified 21 separate discharges of raw sewage from various private sugar plantation camps and set an objective of eliminating many of these discharges during FY 1972. Review of the files for these discharges revealed that only four had been eliminated by June 30, 1972. An additional nine are scheduled for elimination by December 31, 1972, although delays of up to December 1975 had been requested in four of these instances. The elimination of the other eight discharges was to be accomplished during the period June 1973 through August 1975, although delays of up to December 1975 had been requested in seven of these instances. We believe the state's failure to effectively accomplish this plan objective is generally attributable to initially granting overly liberal implementation schedules for abatement actions of up to 59 months. In subsequent attempts to eliminate these discharges on a more timely basis, the state gave notice that it intended to revoke many of these permits because of insufficient implementation schedules. For the most part, these notices have become delayed in the appeal or hearing process. In many instances, the companies indicated they wished to abandon the camps at various future dates in lieu of abatement facilities. These dates ranged from December 1972 to December 1975. In four instances, the companies indicated they wished to install fairly high levels of treatment but contended that the villages were eligible for Federal grant support and wished to defer action until such support materialized. In none of the 21 instances of raw sewage discharge had the state required interim abatement measures as a condition of the permit or taken formal enforcement action. In making sanitary health reviews, representatives of the state have described some of these discharges as "unable to pass any health regulation," "an insult to the code of sanitation, common sense and human decency," and that these "raw sewage discharge(s) must stop immediately." In view of the state's own assessment of the nature of these discharges, and the relatively simple abatement facilities available as either short or long term measures, including cesspools or oxidation ponds, we believe more timely implementation schedules are needed for these discharges. These should include acceptable and timely interim abatement measures and appropriate formal enforcement actions if necessary.

Verification of Corrective Action

Timely follow-up action was needed to assure that pollution abatement accomplishments reported by dischargers have in fact taken place and were effective.

Our selective review of the waste discharge permit application files disclosed seven instances where the discharger reported implementation schedule accomplishments ranging from the installation of treatment facilities to the elimination of the discharge. In none of these instances was there evidence in the files that representatives of the state inspected and verified these reported accomplishments. Even though the actions were not verified, the state annotated its permit application register as "discharge eliminated" or otherwise concluded that the discharger was in compliance with its implementation schedule. Under such procedures, the state had no assurance that required abatement measures had been taken, were effective, and offered reasonably permanent solutions.

The need for such verification was evidenced by instances of discharger misrepresentation of accomplishments and also by ineffective facilities. For example, the Hutchinson Sugar Mill reported that treatment facilities were installed for its mill wastewater and that discharge into the ocean was terminated. Operating reports submitted by Hutchinson during the period September 1971 through May 1972 consistently reported no discharge. However, Environmental Health Specialist Monthly Activities Reports for September 1971, October 1971 and February 1972 indicated that the treatment facilities were inoperative or were being bypassed and that discharges to the ocean were causing significant discoloration. In this instance, it should be noted the specialist's observations were not made part of the discharger's file. Other examples of discharger misrepresentation were observed for the Pepeekeo Sugar Co. and the Mauna Kea Sugar Co. These dischargers, each of which had been issued multiple permits covering several discharges, were taking samples of a single discharge and xeroxing the reported results for submission on the balance of these discharges. An example of facilities of questionable effectiveness was the Hawaii Kai Sewage Treatment Plant. According to the implementation schedule, upgraded facilities were to be placed in operation at the end of 1971. There was no evidence that these facilities had ever been inspected by the state. Although self-monitoring reports on discharges indicated extremely high total and fecal coliform readings, action had not been taken by the state to define or follow up on the adequacy of the facilities.

In our opinion, the state should establish formal controls to assure that all pollution abatement accomplishments reported by dischargers are inspected. These inspections should serve to verify that the reported accomplishments had in fact taken place, were effective, and represented a reasonably permanent solution.

Operating Reports

Improvements in the control of operating reports were needed to assure that reports were (i) being received, (ii) complete and meaningful, (iii) contained representative data, and (iv) followed up in instances of adverse or worsening conditions.

Operating reports (self-monitoring of discharges) are required to be submitted by all dischargers with permits or zones of mixing. The constituents to be reported and designated frequencies vary by individual discharger. These reports serve to aid the state in ascertaining the nature and extent of pollutional loading into public waters and in assessing the effectiveness of pollution abatement facilities put into service.

An operating report control log was established for dischargers under permit. Review of this log, however, indicated that it had not been properly maintained. Recent months' operating reports were not posted, and, in some instances, the reports had not been posted since their inception. In addition, a number of dischargers were erratic in submitting operating reports, while some had not submitted the required reports. Although this condition was apparent from a review of data contained in the report log and the water quality data files of the dischargers involved, there was no evidence indicating that the state had initiated follow-up action to obtain the missing reports.

In addition to dischargers under permit, a number of dischargers were operating under designated zones of mixing. Unlike dischargers under permit, an operating report control log was not maintained for these dischargers. Although the conditions of zones of mixing required the submission of operating reports, a number of these dischargers had not done so. Without a properly maintained log, there was no readily available means of highlighting those dischargers not in compliance with reporting requirements. As a result, there was no evidence that the state had identified delinquent dischargers and initiated follow-up action to obtain the missing reports.

A number of dischargers operating under permits or zones of mixing discharged on an intermittent basis. These dischargers were required to submit operating reports each time a discharge occurred. However, none of the water quality data files for those dischargers examined contained operating reports even though state inspectors had ascertained that some discharges had in fact occurred. In our opinion, one of the contributing causes of this condition was the lack of a negative reporting procedure, requiring the discharger to periodically certify that discharges had not occurred. Such a requirement should lend itself to more factual reporting since misrepresentations would provide a basis for possible enforcement action.

It was also noted that the state had not initiated procedures for following up on adverse operating report data. For example, various municipal dischargers were consistently reporting high coliform readings. However, there was no evidence indicating that the state had initiated follow-up action to ascertain the causes or made appropriate recommendations to correct the situation.

We also noted instances where the conditions to be reported did not include certain parameters which appear basic to all monitoring of treatment facilities. For example, two municipal treatment facilities discharging effluent into recharge wells did not report data on coliform organisms. Another municipal facility discharging to inland waters did not report on turbidity. We believe both of these parameters are important in assessing pollutional impact upon receiving waters.

State Leadership

The State of Hawaii could improve its leadership role in the water pollution control area by demonstrating effective actions in regard to state-controlled dischargers. This should include the construction of high quality sewage treatment facilities, timely and effective abatement practices, compliance with waste discharge permit implementation schedules and adherence to reporting requirements. However, we noted at least five instances involving state-controlled facilities where the state had not provided exemplary leadership. These instances ranged from a failure to construct required facilities to the lack of submission of required operating reports. Examples of these situations are as follows:

Samuel Mahelona Memorial Hospital. In this example, the state DOH recognized that this state-controlled facility (i) violated water quality standards, (ii) constituted a public health hazard, (iii) required new treatment facilities, and (iv) should be used in setting a precedent in pollution abatement. However, at the time of our review, the state had not corrected the problem, had not completed interim abatement measures and had lost the initiative in establishing leadership by example. The hospital filed its application for a waste discharge permit on April 17, 1970. The application proposed construction of new facilities citing that the current discharge was cesspool effluent of a poor quality due to soil conditions in the area and was being discharged through an ocean outfall which was broken at the shoreline. A FWPCA survey report, dated August 28, 1970, corroborated the broken outfall and poor quality of the effluent indicated by adverse readings for nutrients and coliform. On October 27, 1970, the DOH wrote a memorandum to the hospital administrator outlining the following points: (i) the cesspools were not satisfactory, (ii) the DOH should be a leader in providing the highest quality of sewage treatment, (iii) new facilities should provide not less than secondary treatment followed by chlorination, and (iv) funding should be requested immediately. On December 17, 1970, the DOH again wrote the

hospital administrator stating that the outfall was in direct violation of water quality standards and was a health hazard because of hospital patient diseases. It again reiterated that the highest treatment was to be provided as a precedent and that an ideal site was available to build a facility to serve the hospital. According to the letter, the site, with subsequent enlargement, could serve the entire Kapaa area. A waste discharge permit was issued on March 5, 1971, providing for completion of construction of required facilities by December 1972. On March 9, 1971, the State Legislature appropriated $225,000 for this project. On April 12, 1971, Region IX, EPA wrote a letter to the DOH stressing the need for action on the hospital situation. The state replied to this letter stating that new facilities would be constructed per the permit implementation schedule. On April 29, 1971, a concept was defined wherein an injection well would be drilled to accommodate the hospital effluent and, at a future date, the effluent of the Kapaa area. On May 28, 1971, a meeting was held with the County of Kauai wherein the county indicated it had hired a consultant to develop a single water management system for the Kapaa area, including the hospital wastewater. The state agreed to transfer project funds to the county for this effort and the county indicated it would fund and proceed with the drilling of the injection well. On June 7, 1971, the state notified the county to proceed with the water quality management plan and with the injection well using the hospital effluent for test purposes. On December 8, 1971, the hospital administrator wrote the State Public Works Division that the county engineer had temporarily suspended site selection pending completion of the water management study. The administrator suggested that the state proceed with its project since it might take the county 4 to 5 years to complete its project. On February 15, 1972, the county estimated that construction of the Kapaa system would start in early to mid-1973 and requested the state to await the final site selection before spending money on a temporary system as all available funds would be needed for the permanent facility. In a reply to the county, the state indicated tht it would not be in the state's interests to postpone the hospital facilities and that the well should be completed before the end of December 1972. On March 28, 1972, the DOH informed the state controller that it was proceeding with the well and would divert the cesspool effluent before the end of the year. It should be noted that these measures will fall substantially short of what the state originally defined as the minimum acceptable level of treatment and can only be regarded as an interim solution. In summary, the foregoing events depict a situation wherein the state recognized that one of its facilities was in need of correction and had an excellent opportunity to establish leadership by example. However, the state allowed the initiative to be assumed by the county which resulted in material delays to the project and will leave the state with only interim measures substantially short of what had been described as the minimum level of treatment.

Waialee Livestock Farm, University of Hawaii. This discharge involved septic tank effluent and raw animal waste. A waste discharge permit was issued for the period March 12 through December 30, 1971. The permit incor-

porated an implementation schedule calling for the elimination of the discharge by December 1971. No action was reported by the university on this project through the date of the expiration of the permit. On February 23, 1972, the state notified the university that its permit would not be extended due to the university's failure to meet any portion of its implementation schedule. After offering a number of reasons for the slippage, including a study of alternative methods and a change in site location of the proposed facilities, the university was granted an extension of its permit to October 1972. However, the amended permit incorporated an implementation schedule dealing only with the septic tank effluent and did not include raw animal waste. The cumulative effect of the foregoing events has been a 10-month delay in the project as a whole and an indefinite delay in correcting the animal waste discharge. Further, the university had never submitted an operating report since the issuance of its permit. Thus, current information on the volume, constituents and strength of the effluent was not available.

Waimano Home. This discharge involved domestic sewage (septic tank effluent with chlorination). A waste discharge permit was issued for the period March 1971 through December 1974. The permit incorporated an implementation schedule providing for the elimination of the discharge in 1974 by connection with a future Pearl City treatment plant interceptor line. A state spot check of the effluent on November 5, 1971, disclosed excessive readings for total disolved solids, BOD, nutrients and coliform. Although it was indicated that the effluent was not continuously discharged into state waters, the substantial time frame required before completion of abatement action demonstrates the need for interim measures. As in the case of the Waialee Farm, the discharger has never submitted an operating report.

Zones of Mixing

The state has granted zones of mixing for the assimilation of discharges under circumstances which, to various degrees, do not appear compatible with water quality standards, do not give adequate consideration to the environmental impact of the discharge, and incorporate areas of water so vast as to preclude effective pollution abatement.

State Water Quality Standards provide for zones of mixing for the assimilation of municipal, agricultural and industrial discharges upon determination that discharges have received the best practicable treatment or control and that basic water quality standards will not be violated. The boundaries of each zone of mixing are to be fixed by the state taking into account (i) the uses of the receiving water, (ii) its natural conditions, (iii) character of the effluent, and (iv) the adequacy and design of the outfall and diffuser system to achieve a maximum dispersion and assimilation of the treated or controlled waste with a minimum of undesirable or noticeable effect on the receiving water. In addition, the state's basic water standards include the provisions that all waters

shall be free of substances attributable to discharges that produce objectionable turbidity or undesirable aquatic life. Our review, however, disclosed a number of instances wherein the state granted zones of mixing under circumstances that do not appear compatible with the foregoing considerations.

One of these areas pertained to discharges of sugar mill wastewater. A number of mills, such as Mauna Kea's Papaikou Mill and Laupahoehoe's Ookala Mill were granted zones of mixing for ocean discharge of mill wastewater containing significant amounts of turbidity causing mud and silt. None of the mills in question had installed siltation abatement facilities prior to being granted zones of mixing but did, and continue to, dump unabated discharges into the ocean via flumes and sluces. Assimilation of the discharge takes place at the surface of the receiving waters through tidal and wave action. Under these circumstances, it would not appear that the basic standard on turbidity had been met. Further, as the waste receives no treatment prior to discharge, it does not appear that the condition of "best practicable treatment" was met. As both of these conditions are prerequisite for the granting of zones of mixing, it does not appear appropriate that the zones should have been granted.

Another area pertained to discharges of treated domestic sewage effluent from municipal sewage treatment plants. The state granted zones of mixing to the Wahiawa and Whitmore Village Sewage Treatment Plants for fresh water reservoir discharge of sewage effluent despite shortcomings in the environmental impact statements, reported fish kills, and adverse effluent values. Specific shortcomings of the impact statement were identified by the University of Hawaii and included: the absence of consideration of alternative outfalls; the lack of discussion on dilution at high and low reservoir levels; inadequate discussion of fish kills and eutrophication; and inadequate discussion of beneficial uses. Additionally, fish kills had been described as substantial and chronic by the U. S. Department of Interior. The dischargers themselves had admitted in zones of mixing hearings that their effluent did not always meet the specific parameters of the water quality standards. Further, current operating reports indicate substantial nutrient loads in the effluent of these dischargers. In view of the foregoing, it did not appear that the dischargers met the conditions prerequisite for the granting of zones of mixing.

In addition to the question as to whether or not zones of mixing should have been granted, a question is also raised as to the size of the areas so designated. The state's water quality standards pertain to receiving waters rather than dischargers' effluent. In applying these standards to receiving waters, the area within the zone of mixing is not a consideration. That is, unless the values of samples taken at water surface level on the perimeter of the zone exceed the standards for that class of water, the discharger would not be held in violation. Therefore, it is in the interests of the dischargers to request large zones of mixing

to fully assimilate their discharges regardless of strength. If the state grants the zones at the size requested, it is unlikely that readings at the perimeter would violate standards. Examples of the size of zones of mixing requested by the sugar mills and granted by the state are as follows:

Mauna Kea Sugar Co. (Papaikou Mill)	15,000' X 5,280'
Laupahoehoe Sugar Co. (Ookala Mill)	16,000' X 5,280'
Pepeekeo Sugar Co. (Pepeekeo Mill)	9,000' X 5,280'
Honokaa Sugar Co.	14,000' X 5,280'

In our opinion, zones of this size go beyond reasonable dilution and appear to merely provide a means by which dischargers can achieve compliance with specific standards. We believe this conclusion is supported by the fact that these dischargers have never been found in violation of water quality standards despite the absence of siltation treatment facilities. Generally, the manner in which zones are granted and administered only serve to hold the discharge to its current levels over the life of the zone. It does not include requirements to improve the quality of the existing effluent unless the volume or strength of the discharge into the zone substantially increases. In this respect, a zone of mixing offers a less satisfactory solution to pollution abatement than placing the discharger under a permit with its attendant schedule of implementation.

Recommendations

We recommend that the DOH:

1. Establish a formal program of physical canvassing or mail inquiry to assure that all dischargers of effluent into public waters are identified and brought under the permit program.

2. Improve its waste discharge permit program by:

a. Issuing permits incorporating definitive implementation schedules for all dischargers previously identified as not being in compliance with water quality standards.

b. Taking action to establish revised permits and implementation schedules for those dischargers whose permits have expired prior to the completion of acceptable corrective measures.

c. Requiring implementation schedules to provide for corrective measures on a timely basis and reinforcing these schedules with appropriate formal enforcement actions as necessary.

d. Requiring acceptable interim abatement measures in those instances where corrective measures will require significant amount of time to complete.

3. Establish a formal system of verification to assure that corrective measures reported by dischargers have in fact taken place, are effective and provide a reasonably permanent solution.

4. Strengthen controls over operating reports by (i) properly maintaining the operating report control log, (ii) expanding the operating report control log to include dischargers under zones of mixing, (iii) initiating follow-up action on missing and incomplete reports, reports containing obvious misrepresentations, and adverse or worsening conditions, and (iv) establishing negative reporting requirements for intermittent dischargers.

5. Demonstrate leadership in the area of water pollution control by examples of high quality sewage treatment facilities, timely and effective abatement practices, and compliance with waste discharge permit conditions at state-controlled activities.

6. Assure that zones of mixing are granted only in those circumstances where (i) basic water quality standards have been met, (ii) best practicable treatment has been attained, (iii) appropriate consideration has been given to environmental impact of the discharge, and (iv) the requested zone provides for a reasonable dilution of the effluent rather than a means by which dischargers can achieve compliance with specific water quality standards with minimal or no effluent treatment.

Region IX Comments

The region commented that the finding was a generally accurate assessment of the Hawaii permit program. The region also stated that, as a result of its criticism of Hawaii's process of issuing zones of mixing, the state was requiring more documentation before it would issue a zone of mixing. The region did not comment on the specific recommendations.

2 - Water Quality Monitoring

Hawaii's water pollution control program could be strengthened by improving procedures for obtaining and utilizing water quality monitoring data. Under current procedures, we found that (i) monitoring was not performed at one island, (ii) monitoring data were not always obtained from some sampling stations, and (iii) available monitoring data, which in some instances, indicated violations of water quality standards were not being adequately reviewed and summarized. As a result, the DOH has not always documented adverse trends or initiated studies to isolate the causes for the water quality violations. In addition, routine drinking water samples obtained by state water pollution control personnel have often shown adverse readings for extended periods without corrective action being initiated. We also noted that the state's procedures for surveillance of permittees needed improvements to assure that spot checks were made as to the accuracy of reported effluent data. Further, monitoring for other pollutants such as heavy metals and pesticides should be accomplished. Additionally, clarification or revision to certain portions of the state's water quality standards were necessary to assure that the standards were applicable and enforceable under all circumstances.

State Monitoring Program

The Sanitary Engineering Branch (the branch) of the DOH is responsible for maintaining a water pollution surveillance program over the various waters within the State of Hawaii. This program is primarily accomplished through a series of shoreline sampling stations located at selected bathing areas and public beaches. In total, approximately 200 such stations have been established on the islands of Oahu, Hawaii, Kauai, Maui, and Molokai. For the most part, samples are collected for bacteriological analysis on a weekly or bi-weekly basis, while chemical analysis is primarily accomplished on a monthly basis.

Our review disclosed that the state had not established any water quality monitoring sampling stations on the island of Lanai, except for those pertaining to drinking waters. As a result, information necessary to measure the effects of discharges on the quality of this island's waters was not being routinely obtained. The lack of monitoring on Lanai was also noted in the prior audit report on State of Hawaii issued by the DHEW Audit Agency on November 21, 1969.

Monitoring data obtained by the state for the other islands were not fully complete since information from some stations was omitted for various

periods of time. In addition, available data applicable to bacteriological and chemical samples were not being summarized by the state for purposes of (i) noting adverse trends or (ii) as a basis for additional follow-up action. Summary of this data would have, for the most part, indicated that water quality standards were being violated. Further, routine drinking water samples obtained by state water pollution control personnel have shown adverse readings for extended periods with no corrective action being initiated.

Water Quality Data. The state had not established effective controls over the routine water quality sampling data obtained by its water pollution control personnel. This was evidenced by the fact that data have not been available from certain monitoring stations for various periods with no evidence of follow-up by the state. For example, bacteriological sampling results were not available for Kauai and Maui during April and May 1972, and for Molokai during February, April and May 1972. Similarly, chemical data from 7 of 21 sampling stations on Oahu were not available during May 1972. State personnel were unable to explain the reasons for these omissions.

Bacteriological Sampling Data. Since the state did not maintain a summary of the data sampled, we summarized the monitoring reports for the period February through June 1972 for the islands of Hawaii, Kauai, and Maui. The schedule below shows that a significant number of the bacteriological samples taken during this period have exceeded the state's standards for total and fecal coliform.

Island	Samples Exceeding Coliform Standards		
	Total Samples	No.	Percentage to Total
Hawaii	732	369	50%
Kauai	112	34	30%
Maui	148	26	18%

For the island of Oahu, sampling results from 59 of 74 monitoring stations had at least one sample which exceeded the state's standards for coliform for the 6 month period ending in June 1972. During this period, the highest coliform readings were found at the following sampling stations: Ala Moana Bridge, Keolu Bridge and Sand Island. It should be noted that there are actually 77 monitoring stations on Oahu where sampling was to be performed. However, sampling has not been performed at three of these stations since May 1971.

Although the above-mentioned sample results indicate problems with the quality of the state's waters, we found that the state had not effectively utilized this data to develop trends and initiate improvements.

Chemical Sampling Data. As in the case of bacteriological sampling, the chemical sampling performed by the state has also shown adverse readings with little indication of analysis of results or initiation of corrective action by the state. For example, we found that the state's standards for either total nitrogen or total phosphorus or both were exceeded at least once during the 6 months ended June 1972 at all 21 chemical sampling stations established on Oahu. Some of the sampling stations consistently exceeding nitrogen standards included Kuliouou Park Beach and Haleiwa Pavillion Beach. Readings at Ewa Beach and Kahana Park Beach have consistently exceeded the state's phosphorus standard. Further, the state PH standard was being exceeded at many of the sampling stations.

Drinking Water Samples. In addition to obtaining water quality monitoring samples, state water pollution control personnel also obtained monthly drinking water samples. The results for samples taken on Maui, Kauai and Hawaii have indicated positive coliform readings in excess of standards in many instances for extended periods of time. As an example, on Maui 25 of the 65 drinking water sampling stations had positive coliform readings during the month of June 1972. The state has not initiated actions to correct these conditions. According to state personnel, the inaction was attributable to a lack of specific procedural guidance as to whether action in this area should be initiated by the Sanitary Engineering Branch or by the Public Health Officer located on each island. In view of the fact that action has not been taken and since the sampling data is available to the branch, it is our opinion the branch has a responsibility to assure that necessary corrective action is taken.

Water Quality Studies and Reports

Although monitoring data has shown problems with the quality of the state's waters, we found instances where the state has not initiated the studies necessary to isolate the specific dischargers contributing to the water pollution problems or followed up on problems noted in studies which were performed.

Most of the water quality studies conducted were performed for the state under contract. These included three performed by Ultramar Chemical Co. for the islands of Oahu in 1968, Maui in 1968 and Kauai in 1969. Additionally, a study titled "Estuarine Pollution in the State of Hawaii," dated March 1970, was performed by the University of Hawaii. Although these reports documented the specific waters where water quality problems existed, they did not define the specific sources of pollution. Also, the state has not performed additional studies to update or expand upon the data included in these reports.

We noted three water studies which the state accomplished using its own personnel. Although each of these disclosed specific problems, we found that the state had not adequately followed up to assure that cor-

rective action was taken. One pertained to the Manoa Stream and indicated that high coliform readings existed. It recommended that the stream not be used for swimming or other full-body contact sports. A follow up on this report in May 1972 disclosed that improvements in the quality of the stream were not apparent, but that "data are currently insufficient to accurately analyze the water quality of the stream." Another survey, performed in November 1970 of the Kapalama Canal, indicated that the canal was polluted and that the sources of pollution were found to be the industries along the canal and residents in the area. In order to correct this problem, the survey contained three specific recommendations. However, the state files do not indicate that follow-up actions were initiated to assure that the recommendations were implemented. The other study performed by the state pertained to the survey of the Kalihi and Moanalua Streams in January 1971. The survey concluded that violations of public health regulations were apparent and actually specified the industrial and domestic dischargers causing the pollution problems. Although follow-up action was initiated in March 1971 to check on the corrective actions taken by the domestic dischargers, we found no evidence that the state had determined if appropriate corrective actions were initiated by the industrial dischargers.

In addition to those studies performed by or for the state, we noted that two additional water quality reports were prepared by EPA and its predecessor organization, FWPCA. The report prepared by FWPCA was titled "Pollution of the Navigable Waters of Pearl Harbor," dated October 1969, and an EPA report, issued in September 1971, was titled "The Hawaii Sugar Industry Waste Study," Although each of these reports contained specific recommendations for corrective action, they did not require the state to indicate its intentions with respect to the recommendations. The state therefore had not furnished any comments concerning the recommendations to either EPA or FWPCA. Although the state has not documented the status of the recommendations, discussions with branch personnel indicated that some of the recommendations have not been implemented. This was illustrated by a recommendation in the Pearl Harbor report which pertained to identifying the high nutrient loads in the Waikele and Waiawa Streams and taking appropriate action to minimize the pollution from these sources. As of the date of our audit, the state had not made a complete survey of these streams to detect the sources of the nutrient load. In addition, the state's monitoring program does not provide for routine monitoring of the water quality of these streams. Since some of the recommendations included in these reports do not appear to have been implemented, it is our opinion that the state should inform EPA of their current status and plans for corrective actions.

Surveillance Procedures

The branch has developed a list of permittees which were to be visited annually to obtain effluent samples. The purpose of the visits were to obtain an independent sampling of the effluent in order to document the

reliability of operating reports submitted by permittees. During FY's 1972 and 1973,there were 40 municipal and industrial permittees included on the list. However, the list included only those permittees located on Oahu. It did not consider the dischargers on the other islands although there were at least 11 separate dischargers on Kauai and Hawaii and 5 on Maui. In our opinion, the sampling should be expanded to include all dischargers under permit in order to help assure that the annual spot checks were made. Additionally, we noted that, during FY 1972, the spot checks were not performed on six of the permittees included on the list. These were Foremost Farms, Standard Oil, C&H Sugar Co., Dole Co., Del Monte Co., and the Animal Quarantine Station. Further, the sampling results obtained from these visits did not always include coliform analysis although this was a required consideration.

We also believe that the effectiveness of the state's surveillance program could be enhanced by monitoring for other pollutants such as heavy metals and pesticides. The state had previously informed EPA in its FY 1972 State Plan that "monitoring for heavy metals will be implemented during this plan year." However, this monitoring was not accomplished. The report titled "Water Quality Program for Oahu with Special Emphasis on Waste Disposal," dated February 1972, indicated that pesticides were being found at mouths of streams. It also stated that the precise meaning of the concentrations of pesticides could not be determined without first establishing a monitoring program to document trends. As of the date of our audit, the state had not initiated a pesticide monitoring program.

Under the present state monitoring program, all sampling stations are at shoreline locations, and offshore sampling is not normally performed. This deficiency was previously brought to the attention of the DOH in a study of Keehi Lagoon prepared by the State Office of Environmental Quality Control in January 1971. Although this report stated that sampling of some significant areas of water recreational use was being missed by not performing offshore sampling, a program for such sampling has still not been initiated.

The state has experienced difficulty obtaining effluent information from U. S. Naval installations and in performing routine sampling for monitoring purposes at these locations. These difficulties were brought out in the FY 72 State Plan which indicated the sampling would not be performed on "stations located on U. S. Navy property due to our inability to obtain permission for access." A further illustration of the difficulties occurred in October 1970 as a result of a state request to the Navy for effluent information. The Navy initially declined to provide the information. In a subsequent follow up in May 1971, the state again requested the effluent data and specified the locations and the parameters which it required sampling information. In July 1971, approximately 9 months after the initial correspondence, the Navy provided effluent data; however, it did not include all the locations requested by the state nor all the parameters desired by the state. At the present time, the Naval

dischargers are not under permit and do not submit periodic operating reports. This was in contrast to the fact that many U. S. Army installations are under permit and do provide the state with periodic monitoring data. In our opinion, EPA assistance should be requested in obtaining required monitoring data from the Naval installations.

For the most part, the amount of effort expended by the state in surveillance of dischargers was quite limited, and primarily consisted of self-monitoring reports submitted by the dischargers themselves. At the present time, the state has not established a program of certifying discharger laboratories. Without such a program, there was no assurance as to the adequacy of personnel, equipment and testing procedures employed in sample analyses or the resultant accuracy of the test results included in the operating reports. To assure meaningful and creditable water pollution control data, the state should establish a laboratory certification program.

Water Quality Standards

We believe that clarification of certain portions of Chapter 37-A (Water Quality Standards) of the State's Public Health Regulation was needed. One of these areas pertained to the standards for temperature and turbidity. These standards were based on deviations from "natural conditions." However, the state had not defined what these conditions were nor had it established sampling techniques providing for concurrent sampling to define these conditions. Without such determinations, the standards for temperature and turbidity were not enforceable. Another instance where clarification of standards was needed pertained to the establishment of nutrient standards for phosphorus and nitrogen. These standards have been established for all waters except for Class 1 and 2 fresh water areas. Again, without applicable standards, the maximum amounts of phosphorus and nitrogen allowable in fresh water areas were not enforceable.

The state water standards also required that Secchi disc or Secchi disc equivalent be used for turbidity analysis. However, during a spot check of one discharger's effluent, branch personnel indicated that it was not practical to make the turbidity analysis using the Secchi disc. The results, therefore, were reported in Jackson Turbidity Units (JTU) which were described as relative and not comparable to water quality standards. Instructions governing operating reports allowed the discharger to report turbidity data on either the Secchi disc or the JTU basis, and a large number of the dischargers were using the latter method. If the JTU method cannot be related directly to water quality standards, then the dischargers should be required to report on the Secchi disc basis or the water quality standards should be revised to provide for both methods.

Recommendations

We recommend that the State DOH:

1. Strengthen its monitoring program by:

a. Establishing water pollution control sampling stations on the island of Lanai.

b. Initiating controls to assure that monitoring data is received from all sampling stations.

c. Establishing procedures for summarizing and analyzing the results of bacteriological and chemical samples for the purposes of establishing trends and initiating improvements.

d. Assuring that necessary corrective action is taken in regards to the adverse readings obtained during routine drinking water sampling.

2. Initiate appropriate action to:

a. Perform the water quality studies or surveys necessary to document the specific dischargers contributing to water quality violations.

b. Follow up and document the extent of corrective actions taken on problems noted in previously conducted studies.

c. Inform EPA of the current status of implementation of those recommendations included in its reports on Pearl Harbor and the Hawaii sugar industry.

3. Improve surveillance procedures to assure that:

a. Spot checks are made to verify the accuracy of effluent data reported by permittees.

b. Periodic monitoring is accomplished for other pollutants, such as heavy metals and pesticides.

c. The current water quality monitoring program is expanded to include offshore sampline locations.

d. Effluent data are obtained from U. S. Naval installations in Hawaii. To the extent that problems are encountered in this area, EPA assistance should be requested.

e. A program for state certification of water testing laboratories is established.

4. Clarify or revise state water quality standards to assure that the standards are applicable and enforceable under all circumstances.

Region IX Comments

The region indicated that it generally agreed with the finding. However, it did not comment on the recommendations.

3 - State Construction Grant Procedures

The DOH needs to establish procedures for performing operation and maintenance (O&M) inspections after construction and interim inspections during construction of Federally-financed wastewater treatment plants. The state has not performed required O&M inspections on projects completed since November 1968 although some were experiencing operational difficulties which have adversely affected the quality of the receiving waters. Also, interim inspections had not been performed on the two active projects, valued at about $2 million nor on three recently completed projects valued at $7.6 million. In addition, adequate follow-up action was not taken to assure that Interim Water Quality Management Plans were received within the time frames established in the state's FY 1972 Water Pollution Control Plan. Further, most of the scheduled pollution abatement actions included in the state's original implementation plan and the proposed revision in October 1971 have not been met. Additionally, procedures needed to be developed to assure that project plans and specifications did not contain inadequacies which can lead to restrictive bidding or a conflict of interest.

Background

Federal Guidelines for Design, Operation and Maintenance of Wastewater Treatment Facilities state that "Effective operation and maintenance of municipal wastewater treatment facilities is an essential element in the preservation and enhancement of our Nation's waters. The tremendous investment of Federal, state and local funds in these facilities must be protected." Chapter 12 of the Handbook of Procedures, Construction Grants Program, included the requirement that "approximately one year after a sewage treatment plant constructed with Federal aid is placed in operation, a visit will be made to determine if the project is providing the service for which Federal assistance was approved. This inspection may be made by a representative of the state agency or by a representative of FWPCA. In either case, the inspector will prepare Form FWPCA-12, Sewage Treatment Plant Operation and Maintenance Practices Questionnaire, to record his findings." In addition, Section 601.35 of Title 18 of the Code of Federal Regulations, dated July 1970, provides that "The State will inspect treatment works not less frequently than annually for the 3 years after such treatment works are constructed and periodically thereafter to determine whether such treatment works are operated and maintained in an efficient, economic and effective manner..."

EPA,Construction Grant Memorandum (CGM) No. 71-17 states that "On projects in excess of $1,000,000, at least one inspection during con-

struction must be made, and additional inspections are desirable wherever possible. Smaller projects will be inspected on a random basis, as staffing permits. The purpose of a partial inspection is to determine that the project is being constructed in accordance with approved plans and specifications and that all Federal requirements are being fulfilled, and to review any specific problems that may have been reported on the project." The State Plan normally specifies the number of projects which the state will inspect during construction.

O&M Inspections

Since November 1968, seven Federally-financed wastewater construction projects have been completed for more than one year. Our review disclosed that the state has not performed required O&M inspections of these projects. It is important that these inspections be performed as we noted instances of operational difficulties being experienced by some of these plants. Illustrations of how operational difficulties can adversely affect the quality of the receiving waters in Hawaii are discussed below.

Waianae Sewage System (WPC-Hawaii-31). This plant was completed in November 1968 for a total eligible cost of $3.8 million. Consequently, O&M inspections should have been performed in 1969, 1970, and 1971. However, we found that the state had not performed these inspections, although an initial O&M inspection was performed by FWPCA on December 2, 1968. While this initial inspection did not note any operational problems, a report titled "Water Quality Program for Oahu with Special Emphasis on Waste Disposal," dated February 1972, and prepared under contract with the City and County of Honolulu inidicated problems with the Waianae plant. It stated "Aesthetic degradation has been reported around the terminus of the Waianae STP outfall. This degradation is caused by a septic discharge which imparts an odor of sewage into the receiving water." Another indication of operational problems was noted by reviewing monitoring data maintained by the state which showed continuing problems with the quality of the effluent from this plant. For example, monitoring information showed that the nutrient standards of 0.15 mg/l for total nitrogen and 0.025 mg/l for total phosphorus were consistently exceeded by the plant effluent which has reached a high nitrogen reading of 25.1 mg/l and phosphorus readings of over 30 mg/l. In addition, total coliform bacteria readings of 4,300,000 and fecal coliform readings of 40,000 per 100 mil. were obtained in May 1972, although the standards for Class A waters indicated that the medium readings should not exceed 1,000 and 200 per 100 mil. for total coliform and fecal coliform, respectively. It is noted that the State Water Quality Standards apply to the quality of the receiving waters and not the plant effluent. However, the poor quality of the effluent indicated that there were some operating problems with the plant. If the state had performed the annual O&M inspections in 1970 and 1971, it may have identified and been able to prevent the problems. In our opinion, the state should perform an O&M inspection

of this plant to ascertain the extent of the operational problems and whether the grantee complied with the grant assurance requiring "proper and efficient operation and maintenance of treatment works after completion of construction."

Wahiawa and Whitmore Village Sewage Treatment Plants. Grants were awarded in May 1968 for the Wahiawa plant (WPC-Hawaii-34) for about $1.5 million and in March 1967 for the Whitmore Village plant (WPC-Hawaii-36) for approximately $553,000. Final inspections of these plants were performed by EPA in June 1970. We found that the state has not performed any of the required O&M inspections. However, according to water quality monitoring data being submitted by the Wahiawa plant, the plant effluent readings for total nitrogen, total phosphate, and total and fecal coliform were quite high. A similar situation also existed at the Whitmore Village plant, except for the fact that coliform readings were not provided nor obtained.

The necessity for the O&M inspections is further illustrated in various studies performed of state waters. For example, the February 1972 report on Oahu's water quality indicated that the Wahiawa Reservoir appeared to have been brought into an advanced state of eutrophy because these two sewage treatment plants were discharging sewage into the reservoir. The report stated that it was one of the few fresh water reservoirs on Oahu available for public fishing and that periodic fish kills have resulted. A similar situation was also brought out in a letter from the U. S. Department of Interior, Fish and Wildlife Service, dated April 18, 1972. The letter stated that "The results of man's abuse and use of the reservoir for a waste receptical is evidenced by the substantial and chronic fish kills." We believe that the monitoring of the operation of these plants by the state through annual O&M inspections is an important tool in identifying and preventing such problems.

EPA performed an O&M inspection on the Whitmore Village plant in May 1971 and identified several operational problems. However, we noted that there was a lack of follow-up procedures by the state to determine if the recommendations included in the EPA O&M inspection were corrected. For example, the EPA O&M inspection of the Whitmore Village plant listed several mechanical problems and stated that "no provision was made for removal of floatable material in the final clarifiers nor settleable material in the chlorine contact chamber." It recommended that the necessary equipment to satisfy the mechanical problems be installed. There was no information available indicating that the state followed up on this or other problems noted.

State personnel informed us that they were planning to accomplish the O&M inspections in the future. In this regards, a report form to document the results of state O&M studies of wastewater treatment plants was devised in August 1972. For the most part, the form incorporated the data required by the Federal O&M form and therefore should fulfill

the O&M inspection requirements. In view of the operating problems existing at many of Hawaii's wastewater treatment plants, it is our opinion that the state should initiate appropriate action to assure that the required O&M inspections are performed and the procedures for following up on existing problems are initiated. Such actions would help assure that the State and Federal Governments' interests in these facilities are protected.

Interim Inspections

The State Water Pollution Control Plans submitted by Hawaii have normally contained tabulations indicating the number of projects to be inspected during the period of construction. This was illustrated by the FY 1972 State Plan which indicated that five municipal facilities would be inspected during construction. However, we found that these inspections had not been accomplished and that the state had not developed adequate procedures for performing the interim inspections.

Our review of five Federally-financed projects, including two plants which were being constructed at the time of our audit, disclosed that interim inspections were not performed. The current projects were WPC-Hawaii-41 with eligible costs of about $898,000 and WPC-Hawaii-43 with eligible costs of $1,061,000. The three recently completed projects (WPC-Hawaii-30,40, and 42)which were not inspected during construction were valued at $7.6 million. In order to assure that construction work is progressing satisfactorily and in accordance with the project plans and specifications and to help preclude subsequent O&M problems, it is important that the state initiate procedures for performing interim inspections.

Interim Water Quality Management Plans

The State Plan for FY 1972 listed specific dates for completion of interim and final water quality management plans for designated basin, sub-basin, or metropolitan areas. The plan also stated that "Since certified interim plans are required for construction grant applications, it is anticipated that all of the scheduled interim plans will be certified during the current plan year." However, we noted that 5 of the 10 sub-basin plans listed in the State Plan were not completed as of the date of our review in August 1972. A schedule of these sub-basins and dates that interim plans were to be completed is shown below:

Sub-Basin/Metropolitan Area	Date Interim Plan To Be Completed
Lanai	May 1971
Lahaina	July 1971
Kapaa	January 1972
Hilo Bay	May 1972
Kona	May 1972

It should be noted that although the target dates for completion of the plans had passed the state had not initiated follow-up action to determine the current status of the interim plans for the above areas. Since the state has allowed each designated basin area to prepare its own sub-basin or metropolitan plans for state approval, it is important that the causes for any delays be determined.

In addition, we noted that certain sub-basin or metropolitan areas were not fully defined but merely listed as "other" in the FY 1972 State Plan. There were four such areas in the plan. Only one of these areas, within the County of Maui, was fully defined during the plan year. In order to assure that final management plans for the entire state are completed prior to the June 1973 deadline, it is important that the state (i) initiate follow up on those areas where interim plans have been delayed and offer its assistance where required, and (ii) fully define all sub-basin and metropolitan areas for interim planning purposes.

State Implementation Plan

Our review disclosed that the state had not established effective procedures for assuring that pollution abatement actions were accomplished within the dates specified in the state's implementation plan. As a result, the approximately 200 scheduled pollution abatement actions included in the June 1, 1967 implementation plan were not attained, and the target dates for action have been substantially set back in a revision to the plan dated October 1971 and the 5-year municipal Waste Treatment Needs List included in the FY 1973 State Plan.

In October 1971, the state proposed a revised implementation plan which significantly delayed the dates that construction of the abatement facilities was to be initiated. This was illustrated by the proposed Pearl City-Halawa treatment facility in which the revised implementation plan changed the original construction completion date of 1970 to 1976. In addition to the slippages in dates between the two implementation plans, we noted that many of the construction dates contained in the 5-year list included in the FY 73 State Plan differed from the dates in either of the implementation plans. For example, the 5-year list stated that construction on the Wailua facility on Kauai was estimated to begin in 1974, whereas the revised implementation plan indicated that the construction would begin in 1971. The original implementation plan indicated that construction on this facility would be completed in 1967. Similar delays in the initiating construction also occurred on the Island of Maui. The importance of timely construction is illustrated by the circumstances on the Island of Maui as there currently are no major treatment facilities on the island. A report issued by the President's Water Pollution Control Advisory Board in June 1971 also illustrated the importance of timely abatement action in Hawaii in its statement that "It is of concern to the Board that Oahu is talking in terms of a ten-year time frame to meet problems which need solution immediately...This Board questions whether

Oahu has ten years." In its report, the board recommended that the State of Hawaii and the City and County of Honolulu assign the highest possible priority to the construction of suitable facilities to adequately treat domestic wastes.

In summary, it is our opinion that the state should strengthen its procedures to assure that implementation dates for abatement actions are realistically established and effectively monitored. In those instances where the construction dates cannot be attained, the state should notify EPA of the reasons for the slippage and the alternative actions which it has proposed.

Project Plans and Specifications

The state should develop procedures to advise prospective grantees of the requirements that restrictive bidding practices and conflict of interest be avoided in the development of wastewater treatment projects. We reviewed the preliminary plans and specifications submitted to the state by the City and County of Honolulu for a proposed wastewater project at Sand Island. This plant is to treat approximately 55 million gallons of discharge per day and will cost in excess of $37 million. As discussed below, we noted that inadequacies which could lead to restrictive bidding and potential conflict of interest were included in the plans and specifications.

The bid package for the Sand Island project listed 33 major equipment items which were to be bid upon. We noted that for 10 of these 33 items only one brand name was specified in the bid proposal and specifically referenced in the project specifications. Although space was provided on the proposal for bidders to write in substitute brand names, the language contained in the specifications would make it difficult to obtain equipment from alternate sources. This was illustrated in the case of the Envirotech Inc. whose brand name was the only one listed for three items of equipment and was one of two bidders for another four items. We noted that Section 21A of the Special Provisions titled "Training and Performance Services" was prepared by Envirotech Inc. This section covered training and performance data relating to various items of equipment, including those which Envirotech Inc. was to bid, and contained the clause that "These services shall be 'municipal services' as provided by Envirotech Inc. or approved equal. All other interested suppliers shall submit to the Engineer at least 20 days before the bid opening, complete descriptive information to substantiate their capability to provide this service." Since Section 21A was made a requirement for all bidders in the major equipment area, Envirotech Inc. was in preferential position on those items on which its brand name was specified. In this case, the use of this firm to develop the special equipment requirements has created a possible restriction of competitive bidding and a potential conflict of interest.

Section 108 of the special provisions titled "Floatation Clarifier Equipment" stated that "The mechanisms and pressurization systems shall be manufactured by Envirotech Corp., Eimco Division, Salt Lake City, Utah. No substitute equipment will be permitted." (Underscore added.) This section also stated that "a lump sum price of $1,063,100 was the agreed, firm price from the Municipal Equipment Division, Envirotech Corporation for the equipment specified." We believe that such wordage is restrictive and should be deleted from the specifications. Further, since Envirotech Inc. is in a preferential position, the state should take additional precautions to assure the competitive bidding practices are adhered to by the City and County of Honolulu on those equipment items on which this firm is bidding. There are several alternatives available to assure that preferential treatment is not afforded to equipment suppliers or manufacturers. It is possible to use technical performance specifications for equipment in lieu of specific brand names. In those instances where only a specific brand of equipment will fulfill the requirements of the plans and specifications, a written justification to this effect should be included in the bid proposal.

Recommendations

We recommend that the State DOH:

1. Assure that all required O&M inspections are performed and that follow-up action is taken on problems noted during these inspections and those performed by EPA.

2. Initiate procedures for accomplishing interim inspections during the construction of wastewater treatment plants.

3. Assure that follow-up action is initiated and assistance provided in those areas where interim plans are behind schedule. In addition, all sub-basin and metropolitan areas should be defined for interim water quality management purposes.

4. Strengthen its procedures to assure that implementation dates for abatement actions are realistically established and effectively monitored. In those instances where the construction dates cannot be attained, EPA should be notified of the reasons for the slippage and the proposed alternative actions.

5. Assure that project plans and specifications submitted by prospective grantees do not contain inadequacies which can lead to restrictive bidding or a conflict of interest.

Region IX Comments

The region had no comments on the finding and recommendations.

4 - Accounting for Section 7 Funds

State procedures for accounting for Section 7 Water Pollution Control funds were not fully effective in the areas of timekeeping and reporting of state matching costs. As a result, labor costs charged to program elements were not properly supported and time distribution records were not maintained by all employees charged to the program. Additionally, state matching costs were not always accurately reported on the Reports of Expenditure (ROE's) submitted to EPA.

Timekeeping Procedures

Improvements in DOH timekeeping procedures were needed to meet program element reporting requirements and to provide support for the reported labor costs. The Procedures for State and Interstate Program Grants dated September 16, 1970 require that salaries and wages chargeable to the state's water pollution control program be distributed to program elements based on time distribution records or sampling of all employees charging the grant program. The program elements include interstate water quality management, pollution control facilities, training, pollution control studies and planning, and public information. In addition, Office of Management and Budget Circular (OMB) Circular No. A-87 provides that amounts charged to grant programs for personal services (whether direct or indirect) will be based on employee payrolls. Salaries and wages of employees chargeable to more than one grant program or other cost objective are to be supported by appropriate time distribution records.

Our review disclosed that the DOH was not following the time distribution procedures required for reporting time by program element. The costs shown in the FY 1971 ROE and costs being accumulated for the FY 1972 ROE included labor based on predetermined factors. That is, the DOH estimated in advance the time that employees would be working on the various program elements rather than basing the labor costs on after-the-fact time distribution records. In addition, employees charged to federal funds were not required to maintain time distribution records and those charged to state matching funds were only accounting for time worked on water pollution control activities rather than the employee's total time.

The state's FY 1973 comprehensive grant application stipulated that a timekeeping system would be implemented and maintained to substantiate charges made for all direct salary costs (to both Federal and state funds) to appropriate programs and program elements. Our review of the FY 1973

timekeeping procedures disclosed that the system had not yet been implemented in August 1972 and the procedures did not include the requirement that 100 percent of the employee's time be accounted for. To meet the requirements of OMB Circular A-87, all employee time should be supported by time distribution records. In our opinion, the timekeeping procedures should be revised to provide for positive reporting of all employees' time, both direct and indirect, by program and other activity.

Reporting of State Matching Funds

Improvements in the state's methods of reporting state matching funds were also needed to assure accurate reporting and to assure that Federal matching requirements were met. We noted that some contracts were reported as expenditures on ROE's at amounts originally awarded without subsequent adjustments in amounts due to contract modifications or cancellations. To illustrate the effect of this problem, we determined that a contract for personal services amounting to $40,000 had been reported as an expenditure of state matching funds on the FY 1971 ROE. The contract, however, had been subsequently cancelled without performance of service or cost to the state. As a result, reported state matching expense was overstated by the value of the contract. Since the state was overmatched, no adjustment in Federal funds earned was necessary. However, reporting procedures should be revised to provide for the reporting of contracts based on actual disbursements, plus accounts payable, for goods and services rendered. This will assure that the amounts reported are consistent with actual cost and will provide appropriate accounting period treatment for those contracts and agreements covering two or more fiscal years.

We also noted that the state was not including indirect costs in its ROE's although indirect cost rates had been established for DOH in accordance with OMB Circular A-87. In lieu of an indirect cost rate, the state had been identifying and charging certain administrative effort to the water pollution control program on a direct basis. This technique is not in accordance with the OMB Circular which requires the application of approved indirect cost rates (subject to grant limitations) as the method of reimbursement for administrative effort. In addition, the charging of administrative effort to the water program and use of indirect cost rates for other DOH programs does not assure an equitable treatment of the costs. In the future, indirect costs should be allocated to all direct activities of the DOH in a manner consistent with the indirect cost agreements.

Recommendations

We recommend that the DOH:

1. Revise its timekeeping procedures to require employee's monthly time distribution reports to account for all time, both direct and indirect, by program and other activity.

2. Strengthen its ROE procedures to provide for the reporting of contracts and purchase orders based on actual disbursements and accounts payable for goods and services rendered.

3. Allocate DOH indirect costs to all programs and direct activities in a manner consistent with negotiated indirect cost agreements.

Region IX Comments

The region stated that it "...has never stressed indirect cost computations, etc., in Hawaii because the state has always consistently over-matched the Federal grant. This may change." The region did not comment on the other aspects of the finding or any of the recommendations.

GENERAL COMMENTS

At the present time, the City and County of Honolulu is discharging approximately 55 million gallons per day of raw sewage into Mamala Bay off Sand Island. The discharge is made through an existing ocean outfall which is 3,600 feet offshore at a depth of 40 feet. According to water quality monitoring data obtained by the DOH, high coliform bacteria densities have been identified in shoreline waters adjacent to the outfall and some water contact activities have been prohibited. In addition to the high coliform, other pollutional effects such as high nutrients, turbidity and floating materials in excess of State Water Quality Standards also exist.

Problems concerning Honolulu's raw sewage discharge were originally commented upon in a study conducted by Metcalf and Eddy Consulting Engineers in 1944. This study recommended that sewage from a then proposed Sand Island outfall should receive primary treatment in order to avoid nuisance which might (i) restrict water recreation, (ii) threaten public health, (iii) reduce attractiveness of ocean waters, and (iv) make public beaches uninviting. It was estimated that the cost to complete such a treatment plant would be about $1.6 million. However, this construction was never initiated.

Upon approval of the State of Hawaii Water Pollution Control Plan for FY 1971 on February 19, 1971, EPA expressed concern over the state's lack of progress in abating the discharge of untreated sewage from Honolulu and requested a program assuring that a minimum of secondary treatment would be provided.

The initial application for a Federal grant to construct the wastewater treatment plant at Sand Island was submitted by the City and County of Honolulu to EPA on May 6, 1971. The application requested Federal funds of about $13.3 million with the estimated total project costs being $25.8 million. The project involved the construction of an 85 million gallons per day advanced primary treatment plant and extension of an existing outfall to an offshore distance of approximately 7,300 feet and at a depth of 300 feet. A formal endorsement of the proposed project was not made by the state until January 19, 1972. On April 19, 1972, a modified state certification of this project was submitted to acknowledge the state's recognition that the project was entitled to priority payment over other eligible projects. In June 1972, the regional office advised the Administrator of EPA that the cost of constructing the Sand Island plant had increased to $37.5 million.

On August 3, 1972, EPA approved the Sand Island project application for a temporary waiver from the BOD requirements for secondary treatment included in Construction Grants Regulation 18 CFR 601.25(b). However, upon the passage of the Federal Water Pollution Control Act Amendments of 1972, which specifically prohibited the construction of wastewater treatment plants with less than secondary treatment, the above waiver was rescinded. The application now being processed for Sand Island is for secondary treatment.

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